

Central America, the West Indies and South America, its presence in Mexico is now authenticated.

The *Habenaria* was determined by Dr. Donovan S. Correll. Numbers cited are those of the writer and specimens have been deposited at the Gray Herbarium.—H. E. MOORE, Jr., Gray Herbarium.

THE NORTH AMERICAN VARIETY OF *EQUISETUM TELMATEIA*

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The name *Equisetum Telmateia* Ehrh. in *Hannövers. Mag.*, 1783: 287 and *Beitr.* ii. 159 (1788), so long used in both Europe and America, has twice given way, at least temporarily, in recent European publications to earlier competitors. A majority of European taxonomists, Ascherson & Graebner, Hegi, Rouy, Britten & Rendle, Briquet and many others, have taken up, without expressing any doubt, the earlier *E. maximum* Lam. *Fl. Franç.* i. (7) (1778), although Milde, *Mon. Equiset.* 19 (1865), maintained that *E. maximum* was a mixture of *E. arvense* L. and *E. Telmateia*. Since *E. arvense* dated from 1753, the removal of that element (if it were there) left *E. maximum* for the large species which, to quote Lamarck, "s'élèvent à la hauteur de trois pieds". At the time these later authors were writing, that conclusion seemed justified and the name *E. maximum* the correct one for the species. But now the International Rules have undergone so many alterations that *E. maximum* has become invalidated! Unfortunately, Lamarck was giving a new name to a species which he thought to have an earlier binomial; for before his description he cited as identical with his *E. maximum* the "*Equisetum fluviatile*. Lin. *Sp.* 1517" (i. e. *E. fluviatile* L. *Sp. Pl.* ed. 1: 1062 (1753) and ed. 2: 1517 (1763), priority of publication then considered a secondary matter. Since Lamarck considered his new *E. maximum* the same as the earlier *E. fluviatile* his new name was illegitimate and by Art. 61 of the International Rules can not be accepted.

Another and still earlier name got temporarily into use for the Giant Horsetail, *Equisetum Telmateia*. This was *E. majus* Garsault, *Traité des Plantes et Animaux*, ii. 166, pl. 258 A (1767),

which was taken up and supported with seemingly sound logic by Thellung in his detailed article, *Nomenclator Garsaultianus* in Bull. Herb. Boiss. sér. 2, viii. no. 11: 778–793 (Oct. 31, 1908). In the next year Schinz & Thellung, in their searching study of the nomenclature of Swiss plants, in Vierteljahrs. Naturforsch. Gesellsch. Zürich, liii. 515 (1909), clearly showed its priority over both *E. maximum* (1778) and *E. Telmateia* (1783). But again a change in the International Rules now throws it out, for by Art. 68 (4) "Specific epithets are illegitimate . . . (4) When they were published in works in which the Linnaean system of binary nomenclature for species was not consistently employed". There is no question about the failure "consistently to employ" "the Linnaean system of binary nomenclature" in Garsault's work. This was definitely asserted by Britten & Rendle in Journ. Bot. xlvii. 322 (1909) in their criticism of Thellung's interpretation. Their concluding paragraph, however, makes one laugh: "It is absurd to attempt a parallel, as Dr. Thellung does, between the nomenclature of Miller's *Gardeners Dictionary*, ed. viii., and that of Garsault. In this edition Miller, as he says in his preface, entirely followed Linnaeus's method; his nomenclature is that of Linnaeus except for additions which also follow the binominal system".¹ It would seem probable that Britten & Rendle must sometime have seen Miller's ed. 8. The following quotation from

¹ To some minds Miller's statement in his Preface, that he was following the method of Linnaeus, does not necessarily mean that he said that he was consistently using binomials. Miller's emphasis was on the *system* of classification, as shown by his own words:

"In the last edition [which was largely polynomial] of this work, the author adopted in a great measure the system of Linnaeus, which was the prevailing method of ranging plants then in use among botanists; but as many of the plants which were treated of in the *Gardeners Dictionary*, were not to be found in any of Linnaeus's works then published, Tournefort's system was also applied to take in such as were not fully known to Dr. Linnaeus; but since that time the learned professor having made great additions to his works, and those additions being generally consulted for the names of plants, the author has now applied Linnaeus's method entirely, except in such particulars, where the Doctor not having had an opportunity of seeing the plants growing, they are ranged by him in wrong classes: as for instance, the *Ilex* or *agrifolium* is ranged in his fourth class, with those plants whose flowers have four stamina or male organs, and four stigmas or female parts of generation; whereas those plants have male flowers upon some, and female upon other plants. The *Laurus* Linnaeus has placed in his ninth class, with those plants whose flowers have nine stamina or male organs of generation, and one female part; but these plants should also be ranged in his twenty-second class, for all the species of this genus have male and female flowers on different plants. These, with some other alterations from Linnaeus's system, have been made in this edition, where the author has given his reasons for so doing, which he hopes will be approved by the public."

Dr. E. D. Merrill's defense of the prevailingly binomial nomenclature of William Bartram clearly shows how futile it is to assert that "In this edition Miller . . . entirely followed Linnaeus's method": "About a week before I received the final proofs of this paper Professor M. L. Fernald called my attention to edition 8 of 'The Gardener's Dictionary' by Philip Miller (1768), the edition in which he changed his entries to the binomial system. He was distinctly inconsistent, for while most of the plant names are binomials, there are a considerable number of monomials and a distinctly large number of descriptive phrases. Thus in the entries under the letter A, with about 560 binomials, there are eighteen polynomials in the form of pre-Linnaean descriptive sentences. Examples are 'Alchemilla foliis lobatis sericeis acutis' (4 binomials under *Alchemilla*); 'Aloe foliis erectis subulatis radicatis undique inerme spinosis' (22 binomials under *Aloe*); and 'Asparagus caule herbaceo erecto, foliis setaceis . . .' (9 binomials under *Asparagus*). I merely cite this standard work, which all taxonomists accept as a source of both generic and specific names, as supporting my contention that Bartram's botanical names should be accepted. Certainly if Bartram's 'Travels' be eliminated, so logically should all the names in Miller's edition of 1768 be discarded, for he was more inconsistent than was Bartram. His intention was clear, in that he accepted the binomial system even if, in a certain percentage of cases he also included cumbersome pre-Linnaean descriptive sentences as the names for certain species that he recognized."² Garsault's book may with justification be rejected because, according to Thellung, the author obviously used uninomials (282), binomials (336) and polynomials (71), intending as Britten & Rendle say, "to use no system, binominal or otherwise".³ So now, until the British force through another change in the International Rules

² Merrill in *Bartonia*, no. 23: 35 (1945).

³ This whole problem of deciding what an early author really intended, when his practise was inconsistent, is a baffling one and liable to utterly conflicting interpretations. What to one student seems to be a work in which "the Linnean system of binary nomenclature for species was not consistently employed", to another sometimes seems just the reverse. Witness Sprague's argument in *Journ. Bot.* lxxvii. 343 et seq. (Dec. 1939), that Oeder's binomials, interspersed among many polynomials, in *Flora Danica*, vol. iii, are not invalidated, because most of his species had binomials; and my reply, with photographic reproductions from Oeder's pages, in *RHODORA*, xlii. 267-269 (1940). As I there state, Art. 68 (4) was one proposed by the British botanists "to remove various sources of ambiguity". So long as ambiguity and contradictory interpretations prevail we are not very near to clarity.

and give us their strictly legalistic interpretation of what they are supposed to mean, we may go back hopefully to the present survivor, *E. Telmateia* Ehrh.

As to the American representative of *Equisetum Telmateia*, the story is brief. In 1862 Milde described in great detail a small fragment, scarcely 4 inches long, of a sterile stem brought to Buchenau in Bremen by a traveller who had picked it near Sonoma, California, this being *E. Braunii* (the name of the collector being Pajeken) of Milde in *Verhandl. Zool.-botan. Gesellschaft in Wien*, 1862: 515, this later treated as *E. Telmateia*, var. *Braunii* (Milde) Milde, *Mon. Equiset.* 246, t. v, fig. 22 (1865). There is no need here to repeat in detail all the minute morphological and anatomical differences pointed out by Milde, the most obvious one emphasized by Luerssen, *Farnpflanzen*, 676—Rabenhorst, *Kryptogam.-Fl.*, ed. 2, iii. 676 (1889). Milde did not have the fertile stem, but merely a fragment of a sterile one. Perhaps the most striking departure of the North American plant (British Columbia to southern California; Keweenaw Peninsula, Michigan) is in the former. Taking the characters from Eurasian specimens and the detailed descriptions of Milde, Luerssen and other European specialists, and from North American specimens and the careful description by Abrams, we get the following contrasts.

EQUISETUM TELMATEIA. *Fertile stem*: 1.5–2.5 (rarely in green-branched forms –5) dm. high, 6–13 mm. thick; sheaths (except lowest), including teeth, 1.5–4 cm. long, all but the uppermost with 20–35 free slender teeth 5–10 mm. long, the uppermost with teeth free or but slightly united in pairs. *Sterile stem*: elongating to 0.5–1.2 (very rarely –2) m. high, with broadly convex smooth or smoothish ribs.

Var. BRAUNII. *Fertile stem* 2.5–6 dm. high, 1–2.5 cm. thick; sheaths 4–9.5 cm. long, with 20–30 lanceolate teeth united by 2's or 3's. *Sterile stem* becoming 0.5–3 m. high, with prominently angled ribs commonly scabrous with siliceous processes.

Other, chiefly anatomical, differences presumably exist, these to be worked out by specialists on the *Pteridophyta* (although Milde noted several), but enough superficial characters exist to demonstrate that *Equisetum Telmateia*, var. *Braunii* is not identical with the European plant, a fact clearly brought out by Milde eighty-five years ago. The occurrence of the plant of the Pacific Slope as an isolated colony on Keweenaw Peninsula (see C. K. Dodge in *Fern. Bull.* xx. 16 (1912), a specimen with more detailed local data in Gray Herb.) is highly significant in view of the oc-

currence there or elsewhere in its neighborhood of completely isolated plants not generally found east of the Continental Divide, such as *Ceanothus sanguineus* Pursh, *Vaccinium membranaceum* Dougl., *Adenocaulon bicolor* Hook. and many others discussed by me in RHODORA, xxxvii., nos. 438–441, their segregation shown in maps 6, 7, and 9 (1935).

Characteristic illustrations of the fertile stems of the two varieties of *Equisetum Telmateia* are the following. Of true European E. TELMATEIA: Milde, Mon. Equiset. t. v, fig. 28 (1865); Pratt, Grasses, Sedges & Ferns Gr. Brit. ed. 3. vi. t. 313 (1873); Syme, Engl. Bot. xii. t. 1888 (1886); Bergdolt in Hegi, Ill. Fl. Mittel-Eur. i. t. 9, fig. 2 (1908). Of the North American var. BRAUNII: Clute, Fern Allies, 59 (1905); Abrams, Ill. Fl. Pacific States, i. 32, fig. 2 (1921).

THE USE OF ALCOHOL IN PLANT COLLECTING

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Recently R. E. Schultes (RHODORA 49: 54–60. 1947) has given us a valuable account of Paul Allen's method of preparing herbarium specimens with the aid of formaldehyde. Schultes points out that the method is useful in the wet tropics, especially where rather limited collections are to be made and where transportation and drying problems are difficult. I should like to append to his article a brief description of another agent, alcohol, which is used in a fashion similar to formaldehyde, to which under certain conditions it may prove superior. Since Schultes has summarized the difficulties of a botanical collector in the wet tropics and the concomitant reasons for treating with formaldehyde, I will not repeat the same problems but suggest that the reader review the present article in conjunction with that of Schultes.

I owe the method here described to Augusto Weberbauer of Lima, an eminent student of the Peruvian flora. In a lifetime of extensive field collecting in some of the most difficult terrain in this hemisphere, Professor Weberbauer has found alcohol to be most useful in the preservation of all kinds of herbarium material. I can recommend it as well, for during two and a half years of wartime field work as a cinchona botanist in Peru, I used Weber-